monthly amount, 7.30, occurred at Tahlequah, and the least, 1.77, at Beaver.—*C. M. Strong.*

Oregon.—The most conspicuous features of the meteorological conditions of the month were the abnormally low temperatures prevailing in many sections and the excessive precipitation.

The mean temperature, 48.7°, was the lowest on record, being 2.4° below normal; the highest was 93°, at Vernonia on the 4th, and the lowest, 2° below zero, at Riverside on the 9th, being the first time on record that zero temperatures occurred during the month of October in Oregon. At many stations of the Willamette Valley and Plateau region the minimum temperature reached the lowest point ever recorded. The average precipitation was 4.42, which is 1.0 above normal; the greatest monthly amount, 11.32, occurred at Nehalem, and the least, 1.32, at Burns. The rainfall was evenly distributed throughout the month, falling in two well-defined periods, viz, from the 10th to the 12th and from the 15th to the 26th. Snow fell over the Plateau region on several days, the fall at Sparta in Union County being the heaviest on record in that section for October.—*B. S. Pague.*

Pennsylvania.—The mean temperature was 54.6°, or 3.9° above normal; the highest was 94°, at Derry Station on the 16th, and the lowest, 15°, at Dushore and Hawley on the 22d. The average precipitation was 1.55, or 1.75 below normal; the greatest monthly amount, 3.81, occurred at St. Marys, and the least, 0.53, at West Newton.—*T. F. Townsend.*

South Carolina.—The mean temperature was 64.2°, or nearly normal; the highest was 91°, at Blackville on the 19th and at Temperance on the 21st, and the lowest, 34°, at Spartanburg on the 23d. The average precipitation was 5.00, or 1.90 above normal; the greatest monthly amount, 9.63, occurred at Blackville, and the least, 1.97, at Gaffney.—*J. W. Bauer.*

South Dakota.—The mean temperature was 48.4°, or about 1.0° above normal; the highest was 96°, at Cherry Creek (P. O. Leslie), on the 1st, and the lowest, 10°, at Ashcroft, on the 31st. The average precipitation was 1.53, or about 0.27 above normal; the greatest monthly amount, 4.41, occurred at Desmet, and the least, 0.43, at Cherry Creek.—*S. W. Glenn.*

Tennessee.—The mean temperature was 62.2°, or 3.9° above normal; the highest was 92°, at Iron City and Trenton on the 13th, and the lowest, 24°, at Silver Lake and Erasmus on the 1st. The average precipitation was 2.47, or 0.12 above normal; the greatest monthly amount, 4.27, occurred at Lynnville, and the least, 0.94, at Bluff City.

On the whole, the month was favorable for harvesting crops, preparing the soil, and sowing wheat; much of the early-sown grain was germinating well.—*H. C. Bate.*

Texas.—The mean temperature, determined by comparison of 43 stations distributed throughout the State, was 2.1° above normal. There was a slight deficiency over the extreme western portion of the State, while over the other portions there was a general excess, ranging from 1.0° to 4.4°, with the greatest over east Texas and the eastern portion of north Texas; the highest was 98°, at Panter on the 7th and at Grapevine on the 15th, and the lowest, 30°, at Marathon on the 27th and at Tulia on the 28th. The average precipitation, determined by comparison of 49 stations distributed throughout the State, was 1.35 above normal; there was a slight deficiency over the western portion of the State and the extreme eastern portion of the coast district, while there was a general excess elsewhere, ranging from 1.00 to 5.85, with the greatest excess over the central portion of the coast district. The rainfall for October was not well distributed throughout the State, and the number of rainy days ranged from none at Sanderson to 12 at Fort Brown and Fort Clark. The greatest monthly amount, 9.00, occurred at Brazoria, and the least, trace, at Sanderson.

The weather, as a whole, has been exceptionally favorable for cotton picking during the season, and the crop has been picked closer than it would have been had not the continued drought retarded other farm work, thus increasing the yield of the crop to some extent. The top crop of cotton was generally a failure. The yield of the cotton crop is light, except in a few scattered localities, and, as a whole, is considerably below an average.—*I. M. Cline.*

Utah.—The mean temperature was 45.6°, or 2.8° below normal; the highest was 96°, at Pahreah on the 5th, and the lowest, 9°, at Woodruff on the 8th. The average precipitation was 1.50, or 0.66 above normal; the greatest monthly amount, 3.86, occurred at Huntsville, and the least, 0.06, at Elgin.—*L. H. Murdoch.*

Virginia.—The mean temperature was 58.5°, or 0.8° above normal; the highest was 88°, at Bigstone Gap on the 15th, and the lowest, 20°, at Burkes Garden on the 1st. The average precipitation was 2.97, or 0.24 below normal; the greatest monthly amount, 6.11, occurred at Callaville, and the least, 0.89, at Cliftonforge.—*E. A. Evans.*

Washington.—The mean temperature was 48.6°, or more than 1.0° below normal; the highest was 86°, at Southbend on the 4th and the lowest, 13°, at Cle Elum on the 14th. The average precipitation was 3.95, which is over an inch above normal. In the eastern section the precipitation was double the normal amount. The greatest monthly amount, 13.73, occurred at Clearwater, and the least, 0.39, at Connell.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 56.8°, or 2.8° above normal; the highest was 91°, at New Cumberland on the 5th, and the lowest, 19°, at Marlinton on the 1st. The average precipitation was 1.39, or 0.99 below normal; the greatest monthly amount, 3.81, occurred at Lanes Bottom, and the least, 0.23, at Powellton. Droughty conditions prevailed during the greater portion of the month; forest fires, which were very destructive to timber, were general over the eastern and central counties; wheat and oats are coming up very slowly, but look fairly well.—*E. C. Vose.*

Wisconsin.—The mean temperature was 52.1°, or about 3.6° above normal; the highest was 88°, at Prairie du Chien on the 23d, and the lowest, 15°, at Spooner on the 21st. Remarkably high temperatures were recorded in all portions of the State from the 22d to the 24th, the record for the last decade of October being broken at nearly all stations. The average precipitation was 2.50, or about normal; the rainfall was heaviest in the north-central counties, the greatest amount being 6.53 at Hayward, 3.69 of which fell in fourteen hours on the 14th and 15th; the least amount for the month was 1.04, at Valley Junction.

The dry weather during the latter part of September and the early part of October seriously interfered with plowing and seeding and rendered the germination of fall grains extremely slow. The droughty condition was broken, however, by the occurrence of liberal and well distributed rains from the 10th to the 16th, and pastures were revived and fall grains were greatly improved.—*W. M. Wilson.*

Wyoming.—The mean temperature was 40.6°, or 3.6° below normal; the highest was 91°, at Fort Laramie on the 1st, and the lowest, 1° below zero, at Fourbear on the 13th. The average precipitation was 1.54, or 0.70 above normal; the greatest monthly amount, 4.81, (47.6 inches of snow), occurred at Centennial, and the least, 0.35, at Lovell.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

EFFECT OF WIND ON CATCH OF RAINFALL.

By G. J. SYMONS, dated London, October 24, 1899.

I desire to say a few words respecting the interesting article under the above title, on pages 308–310 of the MONTHLY WEATHER REVIEW for July, 1899.[1]

As regards the gages at Sacramento, the railroad gage must be of a very bad pattern if it really loses anything of consequence by evaporation. I have no idea what the pattern is, but assuming it to be fairly correct, I have no doubt that its deficit is due to its location "so placed on the roof, near the south end of the building that the wind strikes it with greater velocity than at almost any other location that could have been chosen." Now, if the reader will turn to the article, by the late George Dines in British Rainfall, 1877, pp. 15–25, he will see that this position is apparently precisely that in which the minimum of rain will be collected. While quite approving the suggestion that a shielded gage be established close to the offender, I would also suggest that, if the buildings permit, it would be well to put an unprotected gage 20 or 30 feet to leeward of the present one—according to Mr. Dines' experiments this should collect far more than the old gage.

I wish also to correct an erroneous impression that might be made by reading the paragraph at the top of the second

[1] In reference to the above important letter from Mr. Symons, we may say that when, on page 309, second column, lines 7 and 8, we stated that the pit gage is adopted as the standard in England and Europe, we had in mind those who have investigated the decrease of rainfall with altitude; in such studies the pit gage is considered to have its mouth at the level of the ground, or at altitude 0. It is only for such special researches that Mr. Symons encourages its use. For ordinary use at his thousands of rainfall stations, Mr. Symons always requires an altitude of 1 foot. In this matter, where uniformity is the main point, he is undoubtedly correct. On the average of all the investigations that have been made in Europe and America, it results that the difference between the pit gage and one established at an elevation of 1 foot, or the so-called deficit of the upper gage is between 3 and 4 per cent. In order that the reader may fully appreciate the reliability of this statement we reprint a large portion of the Editor's paper read before the Philosophical Society of Washington, November 24, 1888.—ED.

column, on page 309. We do *not* use pit gages in ordinary work; they have only been used in several cases at stations at which experiments were in progress as to the decrease in the amount collected at different altitudes, but they have never been used at ordinary rainfall stations. Our standard gages have their orifices 1 foot above the natural level of the soil; there is no pit and no protection. An engraving illustrating this matter is given in the "Instructions to Observers," at the end of nearly every annual volume of British Rainfall. We adopted 1 foot chiefly to avoid in-splashing from surrounding soil. Every one did not surround his gage with grass, and we found garden mould in the bottles.

I heartily endorse the Editor's remarks as to the evil of moving old-established gages. Observers little know the harm that they may thus do.

I would plead for the establishment, in the United States, of more gages at, or near, the ground level. In Great Britain the rainfall records are largely used by engineers, they want to know what reaches the ground, not what can be caught on a roof 100 feet above it. Cannot the Weather Bureau secure such records in parks within cities and at agricultural stations. Will not the MONTHLY WEATHER REVIEW and the annual reports indicate which records belong to gages on the roofs and which to those on the ground, as this distinction is one of great importance?

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana, Director of the Central Meteorologico-Magnetic Observatory, the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published on our Chart IV.

Mexican data for October, 1899.

Stations.	Altitude.	Mean barometer.	Temperature.			Relative humidity.	Precipitation.	Prevailing direction.	
			Max.	Min.	Mean.			Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Culiacàn Rosales (E. d. S.)	112	29.69	97.7	63.5	81.9	57	0.69	ne.	ne.
Durango (Seminario)	6,243	24.05	87.8	43.2	64.2	59	2.12	sw.	e.
Leon (Guanajuato)	5,934	24.31	82.2	37.2	64.4	62	1.18	sse.	se.
Mexico (Obs. Cent.)	7,472	23.08	78.1	37.0	59.9	64	0.81	n.	ne.
Morelia (Seminario)	6,401	23.98	79.3	43.7	56.7	77	1.88	w	w.
Puebla (Col. Cat.)	7,112	23.38	78.4	39.7	63.1	84	2.29	ene.	nw.
Saltillo (Col. S. Juan)	5,399	26.39	78.1	44.6	65.5	80	5.79	s.	sw.
San Isidro (Hac. de Guanajuato)	.....	.....	83.8	59.9	.....	....	2.61	.....	.....
Silao	6,063	24.28	77.9	47.3	66.7	62	1.44	ese.	w.

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, October, 1899.

The station is at 21° 18′ N., 157° 50′ W.
Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.
The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other.
The rainfall for twenty-four hours has always been measured at 7:30 p. m., not 1 p. m., Greenwich time, on the respective dates.
The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m., Greenwich time, or 2:30 a. m., Honolulu time.								Total rainfall at 9 a. m., local time.
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	29.98	73	69.5	83	70	65.7	72	ne.	3	4	30.04	29.95	0.08
2	29.96	75	69	84	73	67.7	72	ne.	1-3	6	30.02	29.93	0.00
3	29.98	74	71	85	75	68.7	67	ene.	3	4	30.05	29.95	0.08
4	30.02	75	68.5	83	73	68.0	72	ne.	4	3	30.08	29.98	0.01
5	30 05	75	68	84	75	65.0	64	ne.	4	1	30.08	29.99	0.00
6	30.04	74	67	84	75	63.5	62	ne.	3	1	30.09	30.00	0.00
7	29.98	74	67	83	74	64.0	64	ene.	3	5	30.06	29.95	0.00
8	29.91	70	67	84	73	65.5	69	ne-sw.	1	3-8	29.97	29.89	0.00
9	29.91	70	65	82	68	67.0	78	s.	1	4-8-0	29.95	29.87	0.00
10	29.92	73	67	85	64	63.5	64	e.	1-3	1	29.95	29.88	0.00
11	29.88	71	66.5	83	70	62.5	63	e-n.	1	1-2	29.95	29.85	0.00
12	29.85	72	69.5	83	71	65.3	70	se.	2	4-10	29.93	29.85	0.12
13	29.87	74	72	77	71	70.0	86	e-s.	3	10	29.94	29.81	0.06
14	29.94	71	69.5	83	74	70.3	82	s.	2	10-3	29.96	29.89	0.00
15	29.93	75	69	85	71	68.0	73	e-ne.	3-0	5	29.99	29.90	0.00
16	29.96	75	66.5	84	75	65.7	66	e-ne.	1-3	3	30.00	29.91	0.00
17	30.00	75	66.5	83	74	63.7	61	ne.	3-6	4	30.03	29.94	0.04
18	30.00	73	67.5	82	71	63.7	61	ne.	5-6	4	30.07	29.97	0.40
19	29.91	70	67.5	79	70	65.5	72	ene.	4-2	8	30.03	29.91	0.70
20	29.87	71	68.5	79	69	65.0	74	nne.	2	8	29.97	29.87	0.38
21	29.87	72	70	77	70	68.0	82	nne.	2-4	8	29.93	29.85	1.40
22	29.93	74	68.5	77	70	69.0	85	ne.	6-2	5	29.97	29.87	0.19
23	29.95	74	68	80	71	65.7	70	ne.	3	4	30.00	29.91	0.01
24	29.97	74	66.5	81	73	65.0	67	ne.	4	4-8	30.03	29.93	0.00
25	29.95	74	69	79	71	62.5	64	ne.	2	5	30.02	29.95	0.10
26	30.02	75	67	78	72	67.0	75	ne	6-2	8	30.04	29.94	0.08
27	30.06	74	66	80	73	64.0	65	ene.	6-2	8	30.10	30.00	0.07
28	30.04	72	65.5	80	72	61.7	63	ene.	5	8	30.11	30.03	0.05
29	30.01	72	65.5	78	69	62.0	65	ne.	4	6-3	30.08	29.98	0.00
30	29.99	69	67	80	72	63.5	65	ne.	3	3	30.04	29.94	0.02
31	30.00	69	65.5	78	68	65.0	78	ne-n.	1-0	8	30.05	29.95	0.28
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.08
Means.	29.96	72.9	67.5	81.4	71.5	65.5	70.7	.....	2.9	5.5	30.02	29.92	....
Departure	+0.05	.....	.....	.....	.....	—0.7	—1.0	.....	.....	+1.2	.....	.....	+1.56

Mean temperature for October, 1899 (6+2+9), +3=75.7°; normal is 76.3°. Mean pressure for October (9+3)+2=29.971; normal is 29.966.
*This pressure is as recorded at 1 p. m., Greenwich time. †These temperatures are observed at 6 a. m., local, or 4:30 p. m., Greenwich time. ‡These values are the means of (6+9+2+9)+4. §Beaufort scale.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently arrived in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Das Wetter. Berlin. 16 *Jahrgang.*

Bebber, von, W. J. Wissenschaftliche Grundlage einer Wettervorhersage auf mehrere Tage voraus, insbesondere im Interesse der Landwirthschaft. P. 217.

Meinardus, W. Ueber die Nothwendigkeit hydrographischer Studien im nordatlantischen Ocean zum Verständniss der meteorologischen Erscheinungen im nordalpinen Europa. P. 222.

Davis, W. M. Die Cirkulation der Atmosphäre. (Fortsetzung.) P. 228.

Weise, — Wolkenbildung, Regen und Wald. (Schluss.) P. 233.

Philosophical Magazine. London. Vol. 48.

Chattock, A. P. Velocity and Mass of the Ions in the Electirc Wind in the Air. P. 401.

Bulletin American Geographical Society. New York. Vol. 31.

Ward, R. De C. Acclimatization of the White Man in the Tropics. P. 367.